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Leung

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(54) **FLEXIBLE MOBILE COMPUTING DEVICES**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,307,751 B1 * 10/2001 Bodony et al. 361/749
6,421,235 B2 7/2002 Ditzik

(Continued)

FOREIGN PATENT DOCUMENTS

DE 10131547 1/2003
EP 1635313 A2 3/2006

(Continued)

OTHER PUBLICATIONS

Schwesig et al., "Gummi: A Bendable Computer," CHI 2004, Apr. 2004, Vienna, Austria, vol. 6, No. 1, pp. 263-270 (8 pages).

(Continued)

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(57)

ABSTRACT

A flexible mobile computing device includes a flexible display having a first display portion, a second display portion, and a third display portion positioned, along a longitudinal axis of the device, between the first and second display portions. The device also includes a printed circuit board (PCB) portion positioned behind the first display portion. Additionally, the device includes a battery portion positioned behind the second display portion. The device also includes a flexible connector positioned behind the third display portion, extending along a latitudinal axis of the device, and connecting the PCB portion to the battery portion. The flexible connector is configured to permit the first display portion to twist relative to the second display portion about an axis of the device other than the latitudinal axis. In addition, the flexible connector is configured to permit inward and outward bending of the device.

18 Claims, 6 Drawing Sheets

